DRY CLEANERS

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Northwest Hazardous Waste Conference

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Dry Cleaner Sector

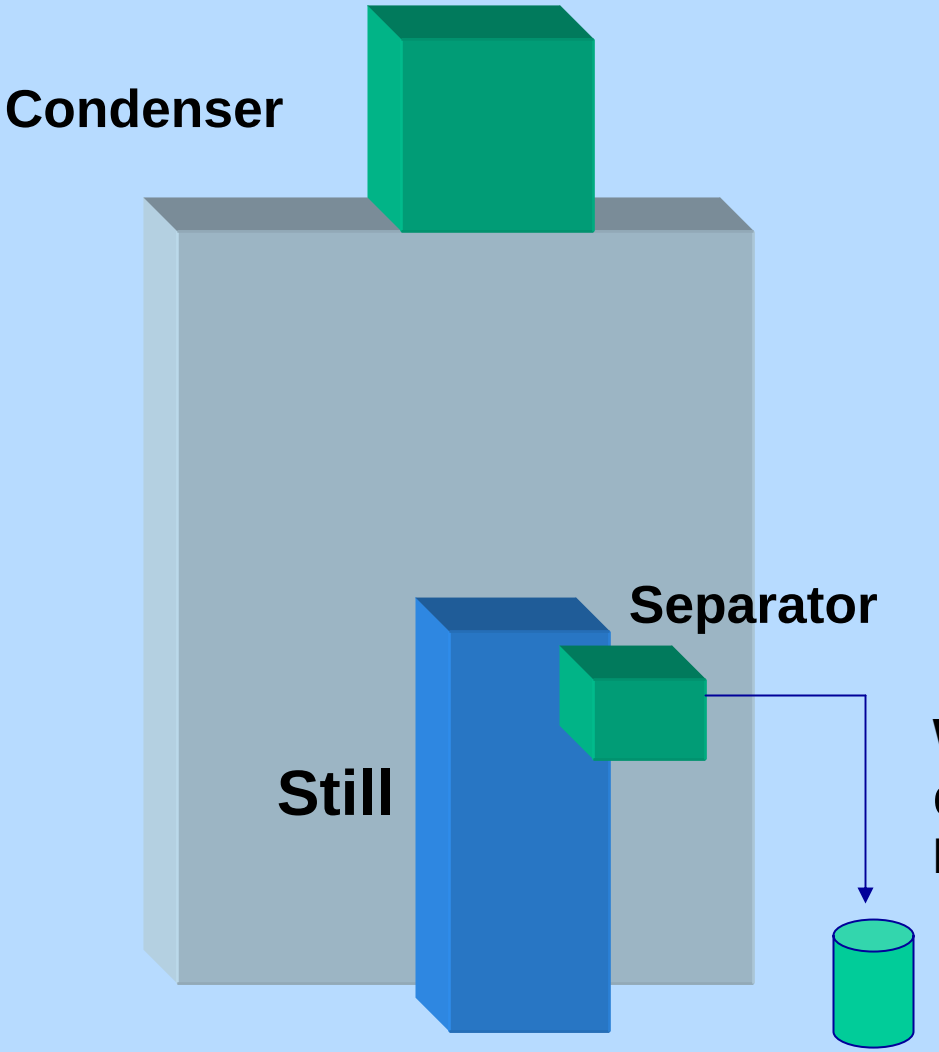
- Equipment & Wastes
- New rules
- Sector outreach ideas
- Alternative solvents

Dry Cleaner Shops

- Typically CESQG
- Mostly use chlorinated solvent (PCE)
- 800 in Washington

Perchloroethylene (PCE) Tetrachhloroethylene

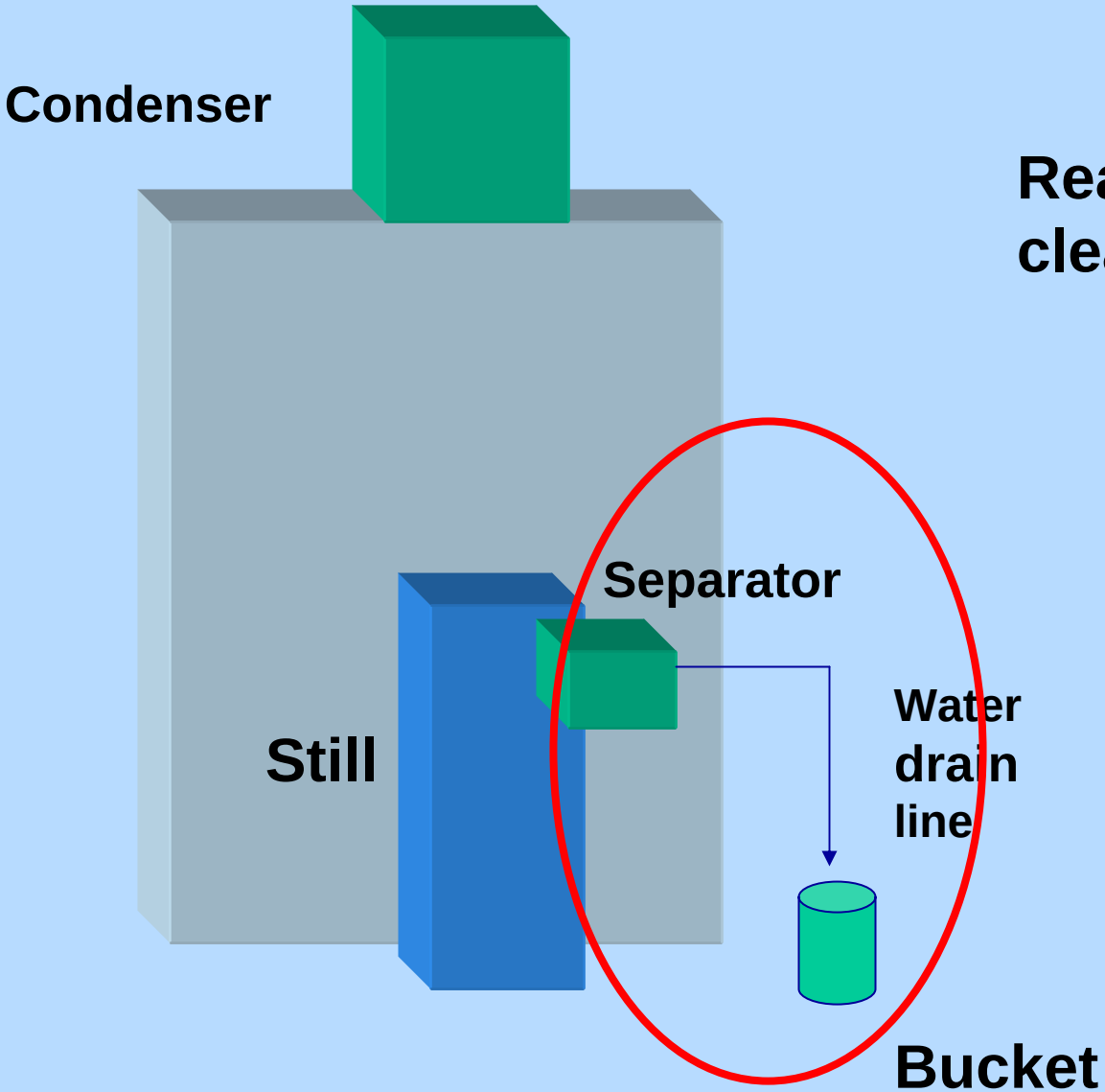
- Animal carcinogen
- Probable human carcinogen
- PEL 100 ppm (25 ppm recommended, 5-10 ppm may be proposed)
- Toxic to nervous system, liver
- RCRA listed waste F002
- TCLP limit of 0.7 ppm



Rear of dry cleaning machine

Dry Cleaning Wastes

- Filters
- Distillation bottoms
- Separator water
- Air emissions
- Spills
- Discarded “spotting” products



Rear of dry cleaning machine

Perc Separator Water

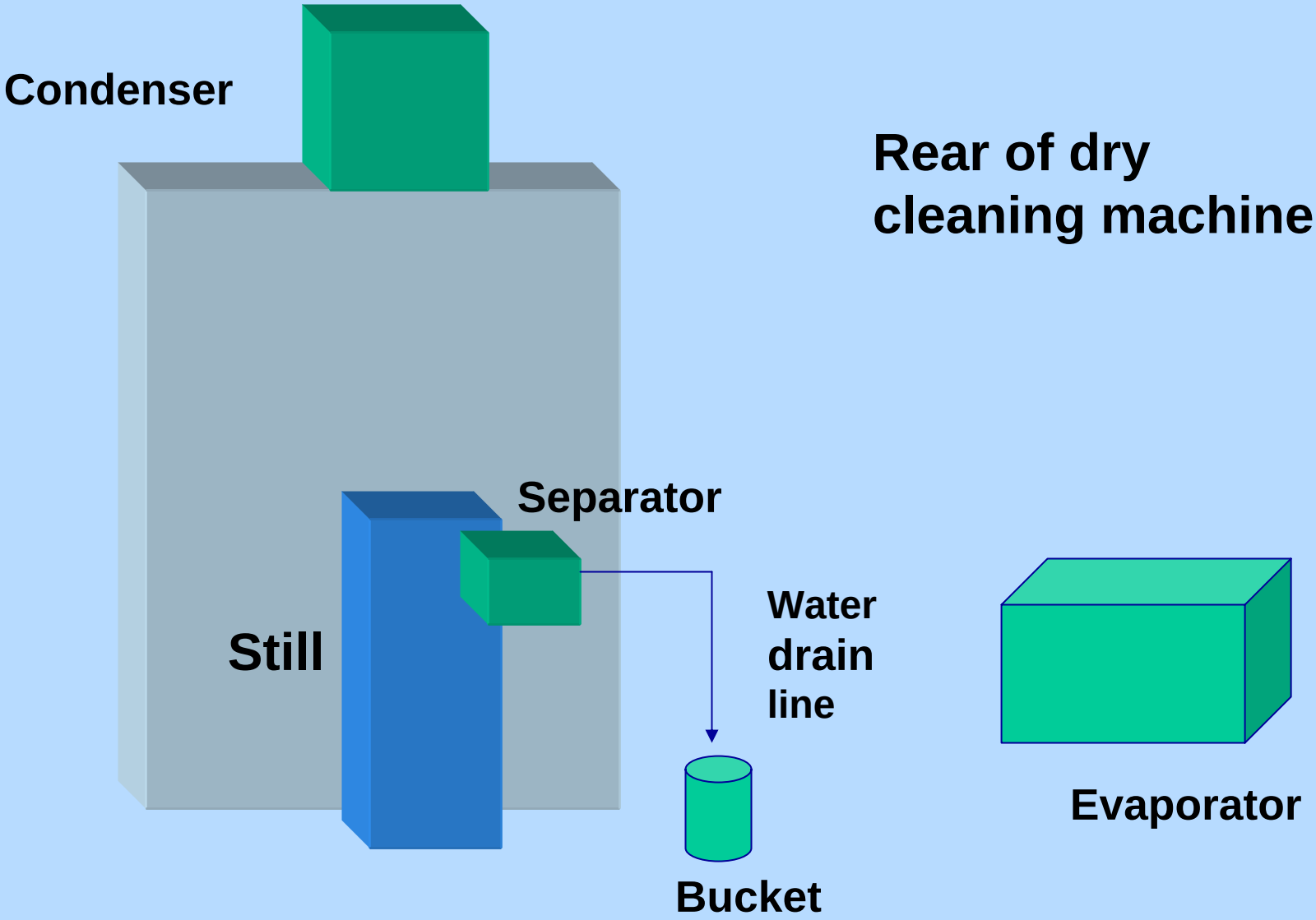
- Water mixed with chlorinated solvent
- Roughly a gallon a week per machine
- Roughly 150 ppm saturated
- May include pure-phase or emulsified solvent

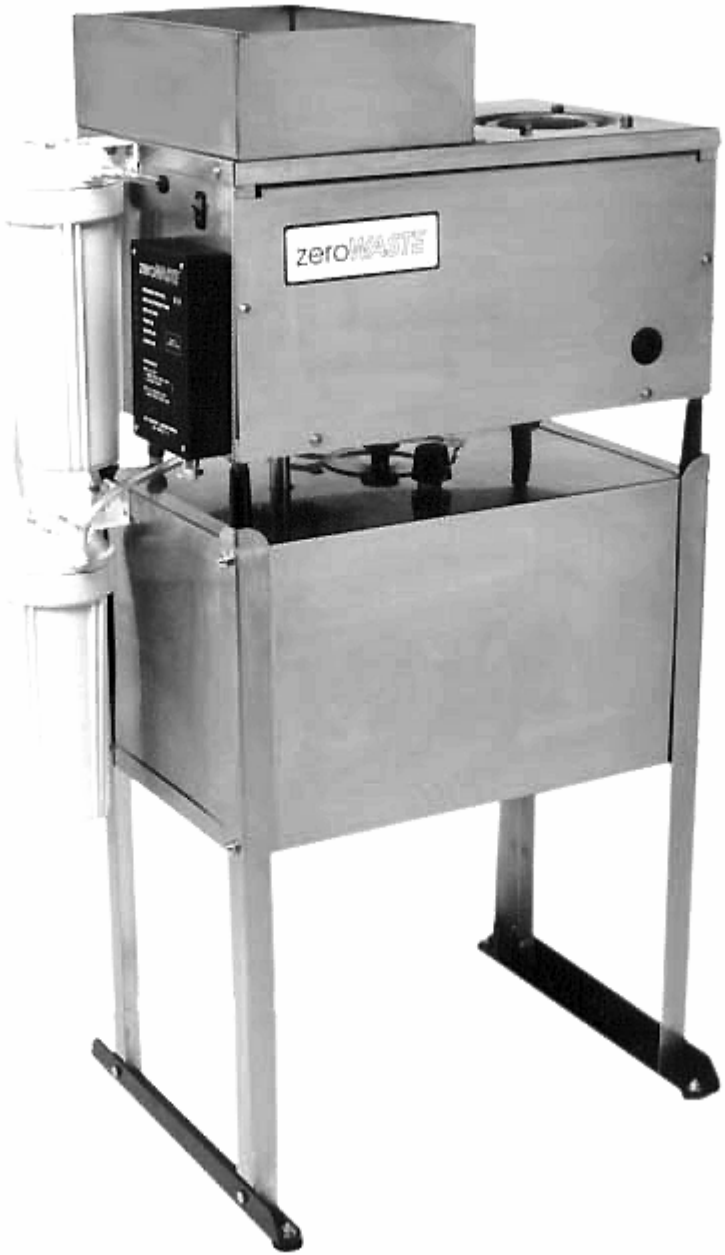
Perc Separator Water

- Solvent can escape from sewer lines and contaminate groundwater
- Superfund liability
- Volatilized in sewers and POTWs

Typical Disposal Practices

- Ship as hazardous wastes
- Down the drain
- Evaporation to air
- ??


Condenser
Rear of dry cleaning machine
Separator
Still
Water drain line
Evaporator
Bucket


zeroWASTE

Evaporator Risks

- Carbon filtration inadequate
- Exposures to evaporate or aspirate
- Environmental releases
- Pure-phase perc destroys carbon filter
- Spills during transfer

ORDEQ Rules for Separator Water

- 2nd solvent settling chamber
- Initial solvent filter, followed by alarm
- 2nd solvent filter
- No visible liquid deposition or accumulation
- See additional requirements
- Record keeping and evidence of compliance

WDOE Dry Cleaner Reference Manual

- Publication # 96-200
- Available from http://www.wa.gov/ecology/hwtr/
- Call (360) 407-6752 for copies
- Korean version available

Sector Outreach

- Air permits (Perc NESHAP and misc. permits)
  - Compliance assistance visits

- Trade associations
  - NWDCA (253) 851-6327
  - ODCA (541) 855-1227
  - KDCAs http://www.fkda.org/advWin.php

Sector Outreach

- Oregon dry cleaner compliance calendar
- Envirostars http://www.envirostars.com/
- Demonstration projects and case studies

Alternative Solvents

Evolution of Dry Cleaning

- 1700s--turpentine
- mid-1800s--turpentine, kerosene, gasoline in USA
- 1920s--petroleum solvent. Chlorinated solvents emerge.
- 1930s--perchloroethylene predominates
- 1960s--CFC-113 and TCA tried

New Technologies

- “High-flash” petroleum solvent
- Green Earth--methyl siloxane
- Wet-cleaning
- Supercritical carbon dioxide
- Rynex--propylene glycol ether

Petroleum Solvents

- **DF2000 (**ExxonMobil)
- Heavy Naphtha – Hydrotreated: 100%
- Is a VOC
- Washington state D category state-only toxic waste (without contaminates)
- Mfr. recommended exposure limit is 300 ppm

Green Earth

- Decamethyl cyclopenta siloxane (Siloxane D5)
- CAS 541-02-6
- ACGIH TWA is 10 ppm
- Washington state D category state-only toxic waste (without contaminates)
- EPA evaluating possible carcinogenicity

Rynex

- Mixture of azeotropes of substituted aliphatic glycol ethers, therefore no CAS
- No exposure limits have been established
- Washington state D category state-only toxic waste (without contaminates)

Supercritical CO_2

- No net green house gas
- Low toxicity
- Low waste volume

Wet Cleaning

- Water-based, with proprietary detergent
- Can handle majority of garments
- http://www.cint.org/publications
- http://www.epa.gov/dfe/pubs/index.htm#garm